

Economic Impact of NASA in Florida FY 2006



Saturn and its Rings
View from the Cassini Spacecraft

Preface

The National Aeronautics and Space Administration (NASA) has a number of Centers that help the Agency pursue the national Vision for Space Exploration. The Kennedy Space Center (KSC) in Florida is one of those Centers, and as such plays an important role in executing the NASA mission.

As good stewards of the resources the nation entrusts to the Agency, NASA strives to maximize the benefits produced by activities it conducts at its Centers, including KSC, while minimizing costs. In addition to the technical, scientific and educational benefits derived from these activities, the business NASA conducts also includes significant economic benefits in the locations it operates across the country, including Florida. To help quantify, understand, and communicate this benefit, the Chief Financial Officer (CFO) at KSC annually produces an economic impact assessment of NASA spending in Florida covering three concentric economic areas: local (Brevard county), regional (central Florida counties) and the state. The CFO typically enlists the assistance of one or more outside economic experts in developing this assessment. The FY 2006 assessment utilizes the results developed by the Transportation Economics Research Institute, a Mt. Dora, FL based, private organization under the direction of Dr. Warren McHone, who is also a Professor of Economics at the University of Central Florida. This economic impact assessment has been collaboratively produced by Dr. McHone and KSC CFO personnel.

The Office of the CFO is pleased to submit the results of the Fiscal Year 2006 assessment, covering the period from October 1, 2005 through September 30, 2006.

Additional copies of the report are available through the Office of the CFO at the Kennedy Space Center, (321) 867-3726.

National Aeronautics and Space Administration
Economic Impact of NASA In Florida FY 2006

Economic Impact of NASA in Florida Fiscal Year 2006

Produced by the NASA Office of the CFO at
Kennedy Space Center, Florida

with the support of W. Warren McHone, PhD
Transportation Economics Research Institute (TERI)

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1. Study Highlights

The following is a summary list of highlights from this study.

- *The monetary injections into the Florida economy by KSC and other NASA Centers to support space and research program operations at KSC were \$1.68 billion in FY 2006. Measured in constant dollar terms this was a 1.2% decrease over the FY 2005 level.*
- *KSC & Other NASA Centers managed 1,731 contracts in Florida in FY 2006. 94% of KSC/NASA spending (including Civil Service wages) was concentrated on-site at KSC.*
- *Total KSC/NASA direct spending was \$1.6 billion in Brevard County, \$20 million in other Central Florida counties and \$55 million in other Florida counties.*
- *Commodity purchases by KSC and other NASA Centers in Florida totaled \$1,523 million in FY 2006. Over 70% of these purchases were concentrated in the top four commodity categories. The top commodity category was the \$539 million for Scientific Research & Development Services.*
- *At 13,630 the total number of KSC on-site workers in FY 2006 was up slightly (1%) over its FY 2005 level. 84% of the workers were employed by prime contractors. 98% of the on-site work force lived in Brevard and close-by Central Florida counties.*
- *Spendable earnings of Workers at KSC were \$984 million in FY 2006. This was a 2% increase in constant dollar terms over the previous year's level.*
- *The average annual salary for KSC on-site workers was \$72,000 in FY 2006, which was twice the wage level of the average Brevard County worker.*

- *836,000 out-of-state tourists visited the KSC Visitor Center (KSCVC) in FY 2006 resulting in \$20 million in wages and non-labor purchases in the State by KSCVC. In addition, out-of-state business visitors to KSC spent \$2.9 million in total local travel expenditures in FY 2006.*
- *The total monetary injection of outside money into Florida's economy by all KSC based activities was \$1.69 billion in FY 2006. This total consisted of \$992 million in wage payments to households and \$701 million in non-labor purchases from contractors. 96% of the total injection went to Central Florida businesses and households.*
- *The injection of outside money into the state and local economies plus the subsequent indirect transactions that were generated by this spending resulted in a FY 2006 total economic impact of NASA in Florida of \$3.6 billion in output, \$1.8 billion in household income and 34,000 jobs. The injections also generated \$177 million of federal taxes and \$83 million of state and local taxes.*
- *93% of the output impact, 96% of the income impact and 95% of the jobs impact occurred in the seven county Central Florida Region.*
- *At the state level each direct job at KSC was multiplied into 2.45 total jobs, each dollar of earnings was multiplied into \$1.78 in total income and each dollar of total direct spending for commodity purchases and wage payments was multiplied into \$2.14 of output production.*

2. NASA Operations at KSC and Elsewhere in Florida

2.1. Space Operations

Based on the lessons learned in the successful *Return to Flight* mission of *STS-114* in 2005, NASA resumed its mission with *STS-121* on *Discovery*, launched on July 4th, 2006, continuing to test new equipment and procedures to ensure the safety of the crew and vehicle.

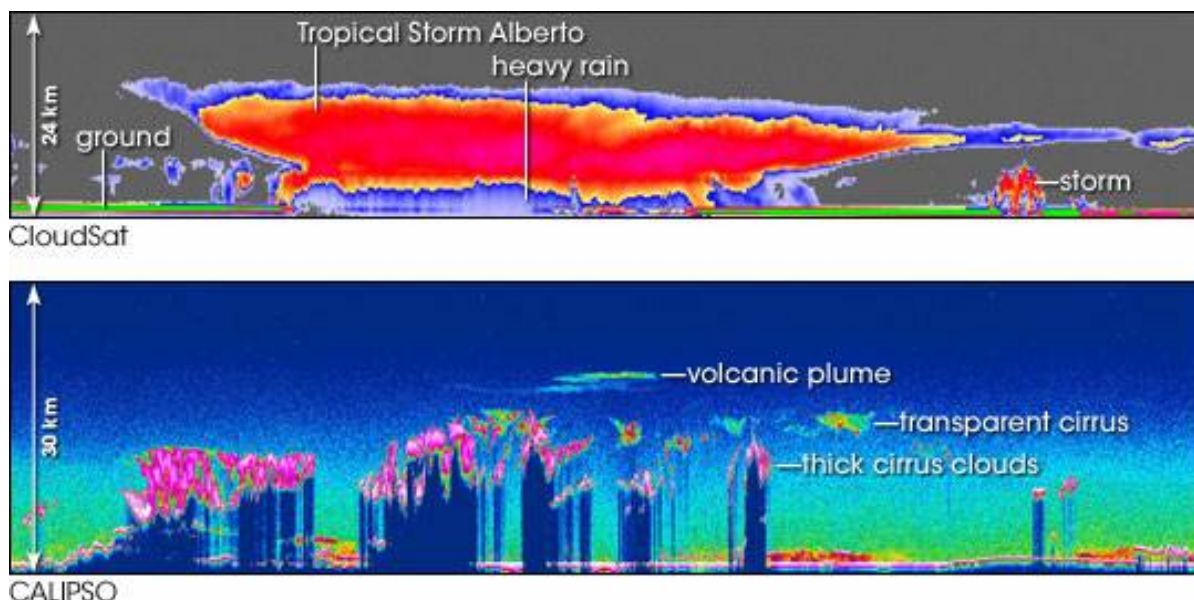


STS-121 Launch and Landing

The *STS-121* crew performed maintenance on the *International Space Station (ISS)* and delivered more supplies and cargo for the future expansion of the *ISS*. The *STS-115* mission on *Atlantis* was launched in September 2006, which restarted assembly of the *ISS*. The crew delivered and installed the massive P3/P4 truss that will be an integral part of the station's backbone and two sets of solar arrays that will eventually provide one-quarter of the station's power.

2.2. ELV Launch Operations

KSC performed payload processing and launch operations management for three Expendable Launch Vehicle (ELV) missions in FY 2006, one from Cape Canaveral Air Force Station (CCAFS), and two from Vandenberg Air Force Base (VAFB). Each of these missions has produced, and will continue to produce, valuable new scientific knowledge. The *New Horizons* mission was launched on an Atlas V rocket from CCAFS in January 2006. This was the first mission in NASA's New Frontiers program. It will be the first mission to visit Pluto and its moon Charon. *Space Technology 5* was launched on a Pegasus XL and *CALIPSO/CloudSat* was launched on a Delta-II, both from VAFB, in March and April of 2006. *Space Technology 5* will explore the Earth's magnetic fields and test and validate new technologies for future science missions. *CALIPSO/CloudSat* will explore the role that clouds and atmospheric aerosols (airborne particles) play in regulating Earth's weather, climate and air quality. *CALIPSO* is a joint mission between NASA and CNES, the French space agency.



CALIPSO & CloudSat Images

2.3. Other NASA Funded Activities in Florida

KSC is playing a significant role in the Agency's Vision for Space Exploration with the formation of the Constellation project and a significant increase of activity in FY 2006. With the program's selection of a prime contractor to design, develop and build the Orion Crew Exploration Vehicle, and projected budget increases over the next few years, the KSC transformation of the Center to provide the infrastructure for the next generation of human launch vehicles is well underway.

Not all NASA activities in Florida originate from the Kennedy Space Center. As in previous years, other NASA Centers funded and managed many contracts (and in turn, subcontracts, vendors and suppliers) for a multitude of Florida products and services. For example, a major Florida aerospace contractor continues support for the Space Shuttle Main Engine (SSME), which is work performed under a Marshall Space Flight Center (MSFC) contract. All NASA costs are included in this study.

2.4. Sources of NASA's Economic Impact in Florida

In addition to KSC/NASA's spending on space operations and research, there are a number of other activities directly associated with KSC that add to its total economic impact. These include the local travel expenditures of out-of-state business and government personnel who travel to KSC to conduct business and the Kennedy Space Center Visitor Center's (KSCVC) sales to out-of-state visitors. The economic impact of all of these activities is presented in this report. The analysis is conducted at three geographic levels – Brevard County, the larger Central Florida Region (includes Brevard, Flagler, Lake, Orange, Osceola, Seminole and Volusia counties) and the State as a whole.

3. NASA Space Program Spending In Florida

3.1. Recent Trends in NASA's Spending in Florida

The money that NASA spends in Florida to support its space missions and other research activities represents an enormous injection into the economies of Brevard County, the larger Central Florida region and the State of Florida. These injections come in the form of wages to local residents and the purchase of goods and services from local businesses and organizations. In FY 2006 KSC and other NASA Centers injected \$1.68 billion into the Florida economy and \$1.60 billion into the Brevard County economy to support space program launch and landing operations at KSC (see Exhibit 1). After adjusting for inflation, these amounts represented a 1.2% decrease for the State and a .6% decrease for the county compared to their FY 2005 levels. This is the first decrease in constant dollar terms since 2003.

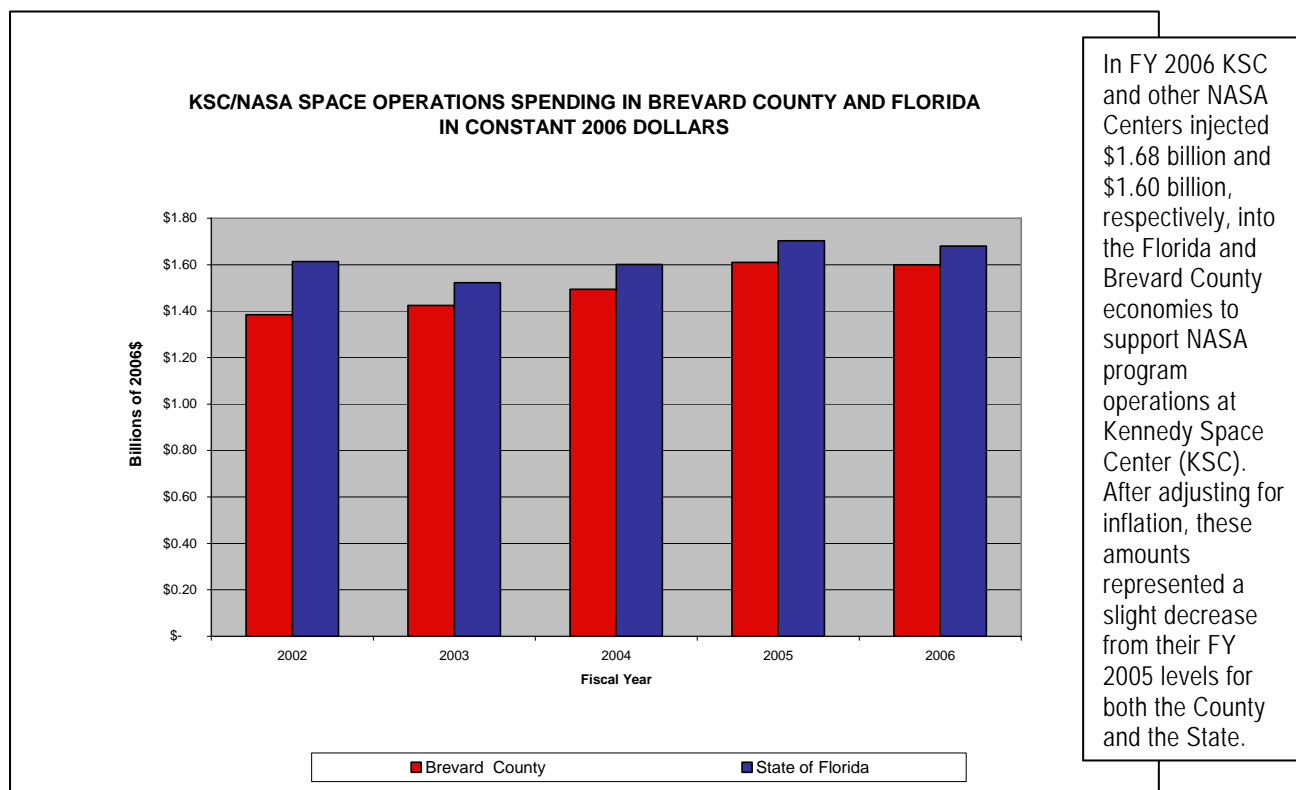


Exhibit 1

3.2. The Location of NASA Spending in Florida

Brevard County (KSC and CCAFS) is the primary launch site for most of NASA's space missions. To support the launch and other related responsibilities, KSC managed 1,204 separate contracts in FY 2006 with a total value of \$959 million. Eight other NASA Centers managed a total of 527 contracts in Florida in FY 2006 with a fiscal year value of \$564 million. The NASA Space Shuttle Program's Space Flight Operations Contract (SFOC) was managed by Johnson Space Center in Texas. The portion of the contract performed at KSC was \$501 million that was 89% of the spending by the eight other NASA centers in Florida in FY 2006. While the majority of the KSC/NASA contract dollars was concentrated in awards to major contractors, over 50% of the awards were for small contracts (\$25,000 or less).

All together KSC and the other eight NASA Centers spent \$1.68 billion in Florida in FY 2006. 94% percent of this spending was for awards to on-site/near-site contractors and wages to on-site Civil Service and contractor workers. Total direct spending in Brevard County was \$1.60 billion. Direct spending in other Central Florida counties and other counties in Florida totaled \$20 million and \$55 million, respectively.

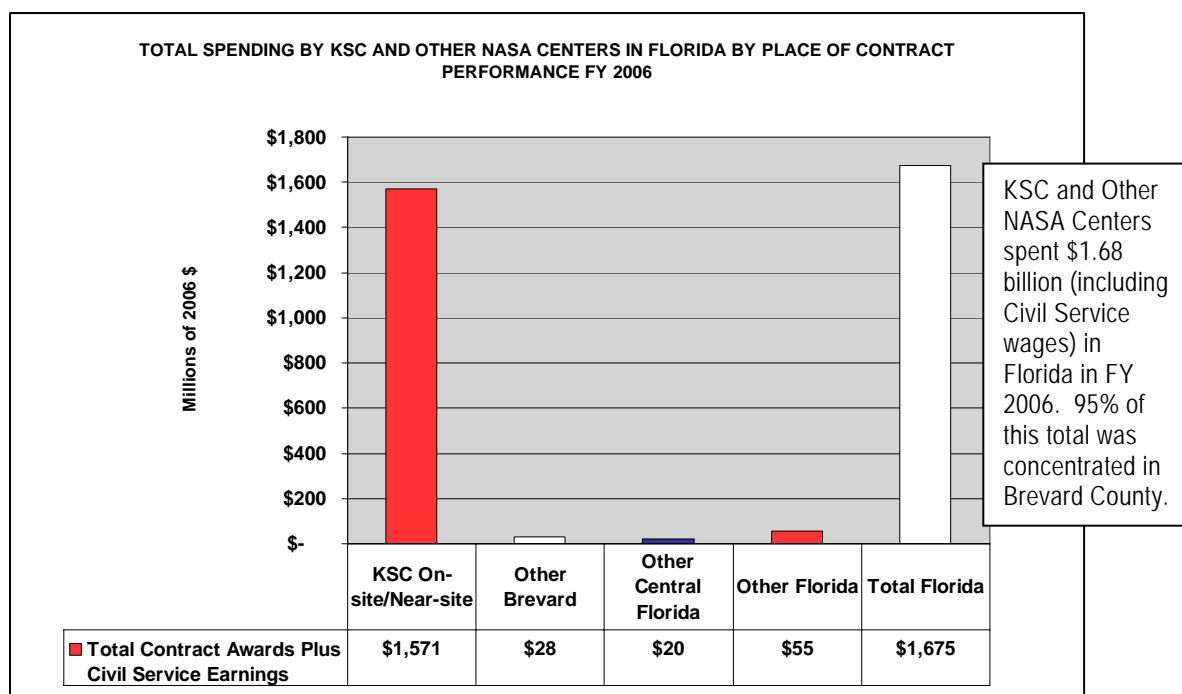


Exhibit 2

3.3. Major Commodity Purchases in Florida

As shown in Exhibit 3, KSC and other NASA Centers' commodity purchases in Florida totaled \$1,523 million in FY 2006. For the purposes of this exhibit, the on-site labor expenditures of the NASA Space Shuttle Programs Space Flight Operations Contract (SFOC) and the Space Gateway Systems (SGS) Base Management Contract were allocated to relevant commodity categories. The top four commodity categories constituted over 70% of the total commodity purchases that were made by KSC and other NASA Centers in Florida in FY 2006. The top commodity category in FY 2006 was the \$539 million in Scientific Research and Development. A large share of the purchases in this category was spending on personnel that are employed on the Johnson Space Center's SFOC.

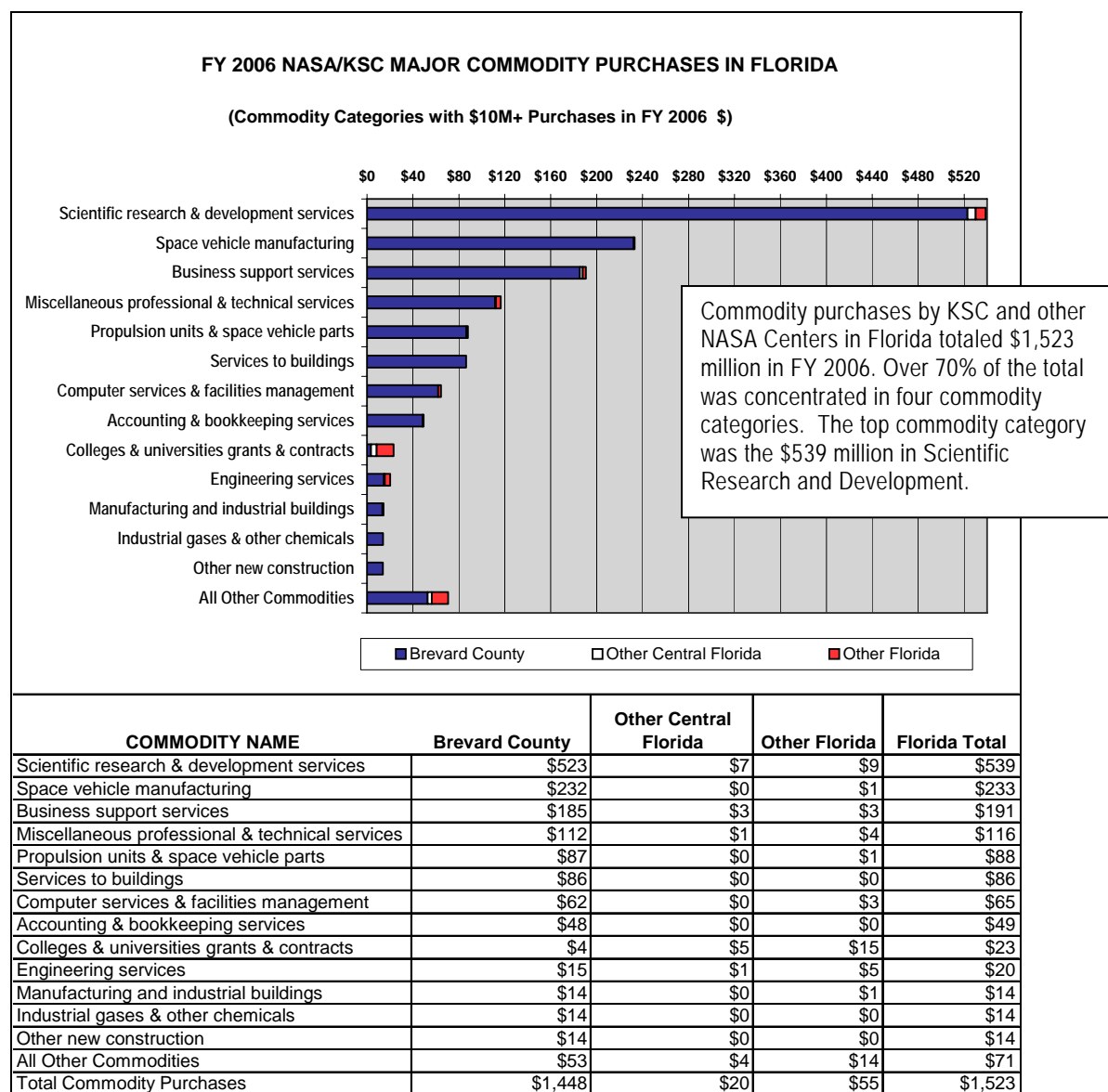


Exhibit 3

3.4. Employment at KSC

There were 13,630 on-site and near-site workers at KSC in 2006. This includes workers involved in launch and space flight control and payload processing and scientific research as well as those workers involved in planning, maintenance and operation of KSC facilities. The overwhelming majority (84%) of on-site workers was employed by KSC/NASA prime contractors. The remainder was federal civil service workers employed by KSC and other NASA Centers. As might be expected, most (84%) of the employees at KSC lived in Brevard County. However, as illustrated in Exhibit 4, almost 2,000 workers commuted from nearby Central Florida counties and a small number of workers lived in other Florida counties or resided outside the State.

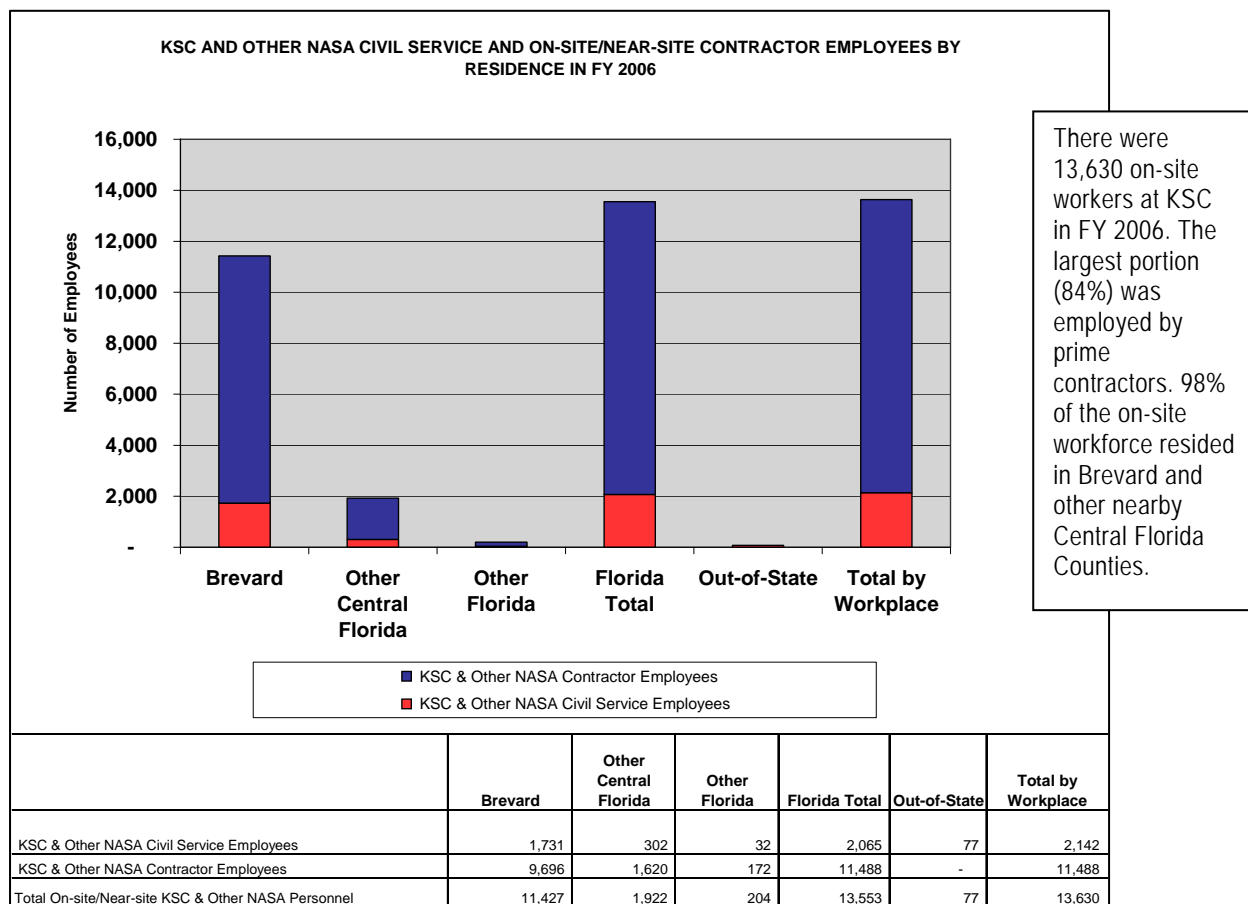


Exhibit 4

3.5. Earnings at KSC

Contract and civil service workers at KSC received \$984 million dollars in spendable earnings in FY 2006 (see Exhibit 5). 98% of these wages were paid to residents of Brevard and other Central Florida counties. A large majority of the workers at KSC are highly trained engineers, scientists and technicians that command relatively high salaries. Accordingly the average annual salary for the KSC workforce was \$72,000, which is twice the \$36,000 salary that was earned by the average Brevard County worker.

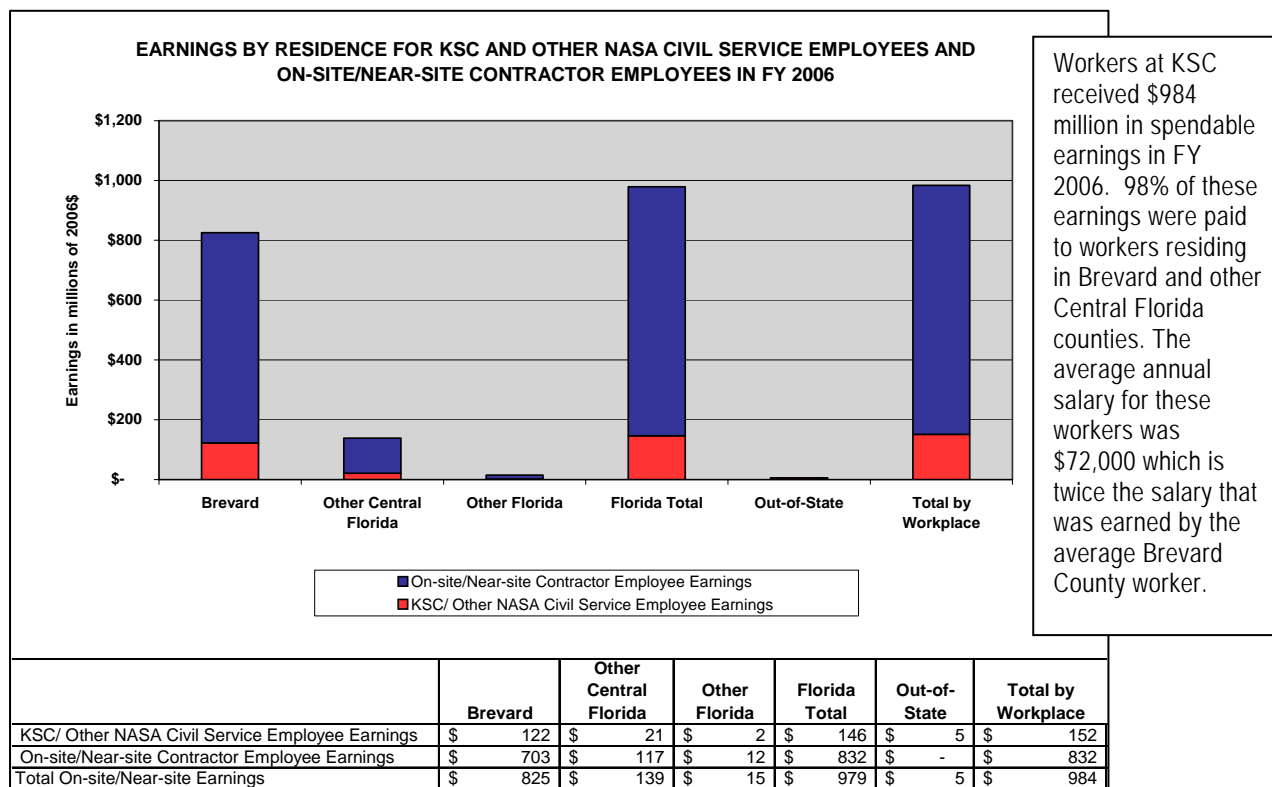


Exhibit 5

4. Spending By Tourists and Business Visitors

4.1. KSC Visitor Center Operations

KSC's economic presence in Florida is not just limited to the contracts and employees that are required to carry out NASA launch and research programs. 836,000 out-of-state residents visited KSC's Visitor Center (KSCVC) in FY 2006. These visitors spent a little over \$46 million on goods and services provided by the Visitor Center. The KSCVC had 695 employees which it paid \$21 million in wages. All of these employees were residents of Central Florida. In addition to its payroll expenses, the Visitor Center spent \$25 million to purchase the merchandise and services that are required to operate the facility.



The Space Mirror Memorial at KSC Visitor Complex

4.2. Impact Relevant Visitor Center Spending

In considering the economic impact of Visitor Center expenditures in Florida, it is necessary to focus only on the portion of the purchases and wages that went to Florida firms and residents. While all of the wages paid by the KSCVC went to Brevard and other Central Florida residents, only 45% of the \$25 million in procurement purchases was from Florida firms. In addition to adjusting for out-of-state purchases, it is also necessary to adjust the in-state spending to reflect the portion that is attributable to out-of-state visitors. The logic behind such an adjustment is that the expenditures by in-state visitors do not represent an injection of outside money into the state and local economies. Instead, these expenditures are only a transfer of economic activity between sectors within the state or local economy. Based on the geographic distribution of visitors, it was determined that 62% of the total activity at the Visitor Center could be attributed to out-of-state visitors. Consequently, the amounts of KSCVC spending that were relevant for the impact analysis were \$13.1 million in salaries and \$6.9 million in other non-labor purchases for a total injection of nearly \$20 million.

4.3. Business Visitor Spending

One other source of NASA's economic stimulus in Florida was the local travel expenditures by out-of-state business visitors that came to KSC in FY 2006. This includes visitors who came from NASA Headquarters, other NASA Centers and out-of-state contractor personnel. The purpose of the visits included pre-launch meetings and reviews, general information exchange and a variety of other business functions. It was estimated that the total local spending for lodging, food, car rentals and other miscellaneous items by business visitors in FY 2006 was \$2.9 million.

All of these expenditures represented an injection of outside money into the local economy. The spending by the Visitor Center attributed to out-of-state visitors and the local travel expenditures of KSC business visitors' resulted in a total injection of nearly \$23 million dollars into the local economy in FY 2006. The details of this injection are show in Exhibit 6.

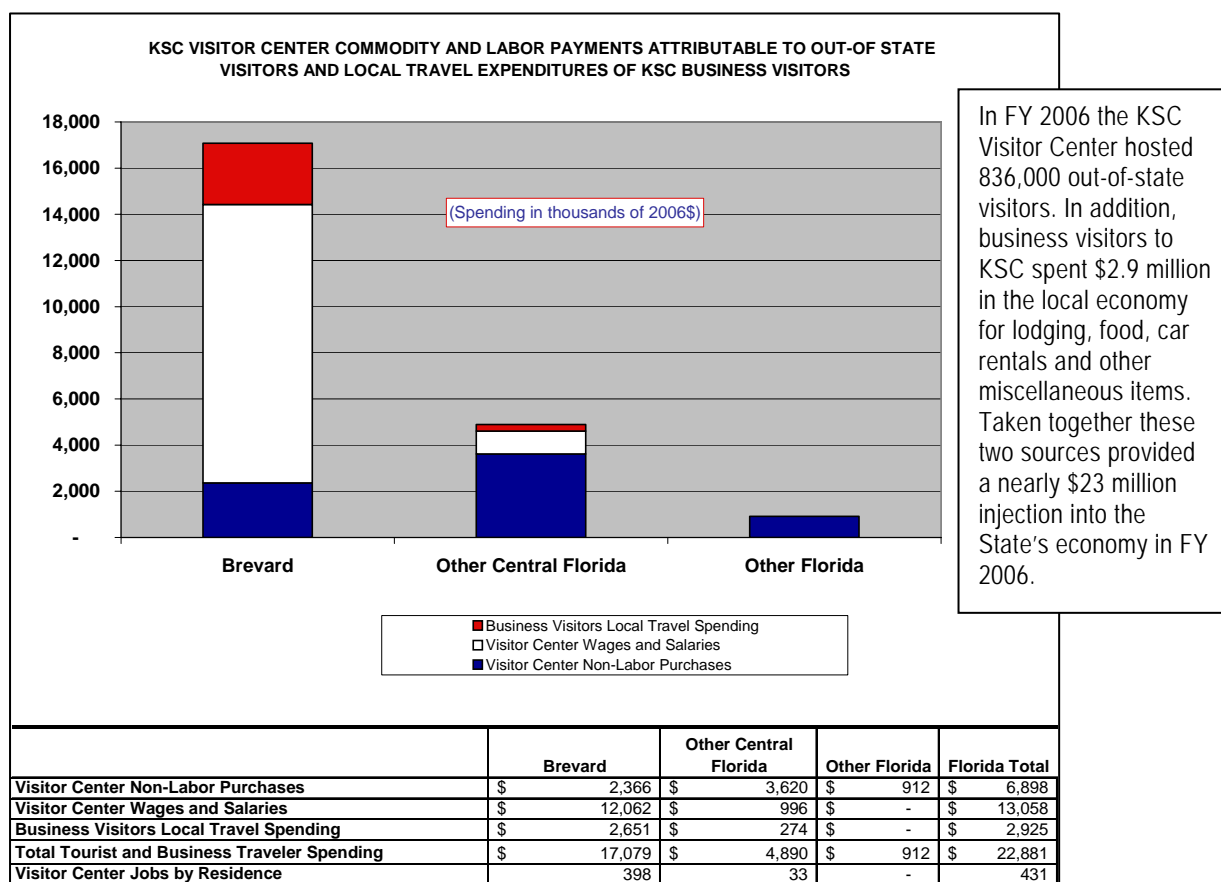


Exhibit 6

5. Monetary Injections into Florida Economies

The purchases and household income payments that are described in the preceding sections of this study are injections of outside money into the economies of Brevard County, the larger seven-county Central Florida region and the State as a whole. These injections enter the economy through direct purchases of goods and services from contractors and the direct payment of earnings to workers. For the purpose of this analysis, all on-site contractors' awards were divided into their wage and non-wage components. The wage portion of these contracts was added to the earnings of KSC and NASA Civil Service workers to arrive at the amount of direct household income received by all on-site workers at KSC. Exhibit 7 shows the total direct commodity purchases and direct household income payments resulting from spending for space program operations, KSC Visitor Center sales to out-of-state tourists and KSC business visitors' local travel spending.

The total injection of outside money into Florida's economy by all KSC based activities was \$1.69 billion in FY 2006. Direct earnings payments to Florida households totaled \$992 million and direct commodity purchases from contractors were \$701 million. 96% of the direct payments went to Central Florida businesses and households.

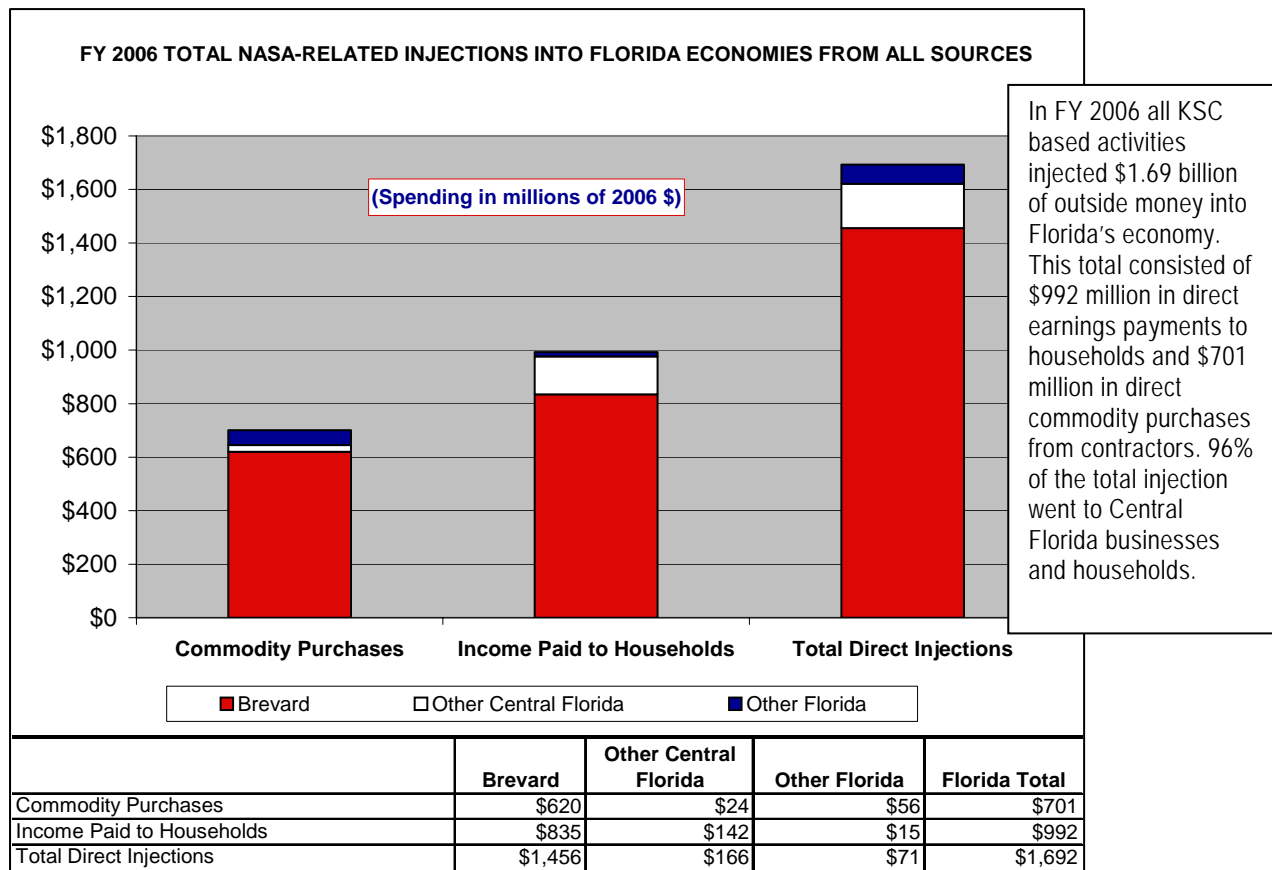


Exhibit 7

6. Total Economic Impact of NASA in Florida

6.1. Indirect Economic Activity Generated by NASA Spending

The economic activity generated by NASA organizations in Florida begins, but does not end, with the direct purchases of these organizations and the wage payments to their workers. This first round of spending generates a secondary set of economic interactions in the local businesses that supply goods and services to NASA contractors and employees. These businesses, in turn, pay wages to their employees and buy goods and services from their own suppliers and the process continues through many subsequent rounds of purchases. All of these rounds of indirect activity are referred to as the generated impact of the initial KSC/NASA injections into the economy.

The tracing and accumulation of all of the many rounds of generated economic activity that are set in motion by NASA's initial stimulus requires a complex set of economic models that map the structure of the economy and the way in which the many sectors of the economy interact to support each other. These models are referred to as regional input-output models. The specific models used in this study utilize a highly detailed breakdown (500 plus economic sectors) of the economy to trace economic transactions. Separate models were built for Brevard County, the larger seven-county Central Florida region and the State of Florida as a whole.

6.2. Total Economic Impact

The total impact of all KSC/NASA activities in Florida (see Exhibit 8) is the sum of the initial injection of earnings and commodity purchases plus the subsequently generated impact of these injections. In FY 2006, this total impact in Florida was \$3.6 billion in output; \$1.8 billion of household income and 34,000 jobs. This activity also generated \$177 million of federal taxes and \$83 million of state and local taxes. The largest share of the impact—93% of the output impact, 96% of the income impact and 95% of the employment impact—occurred in Central Florida.

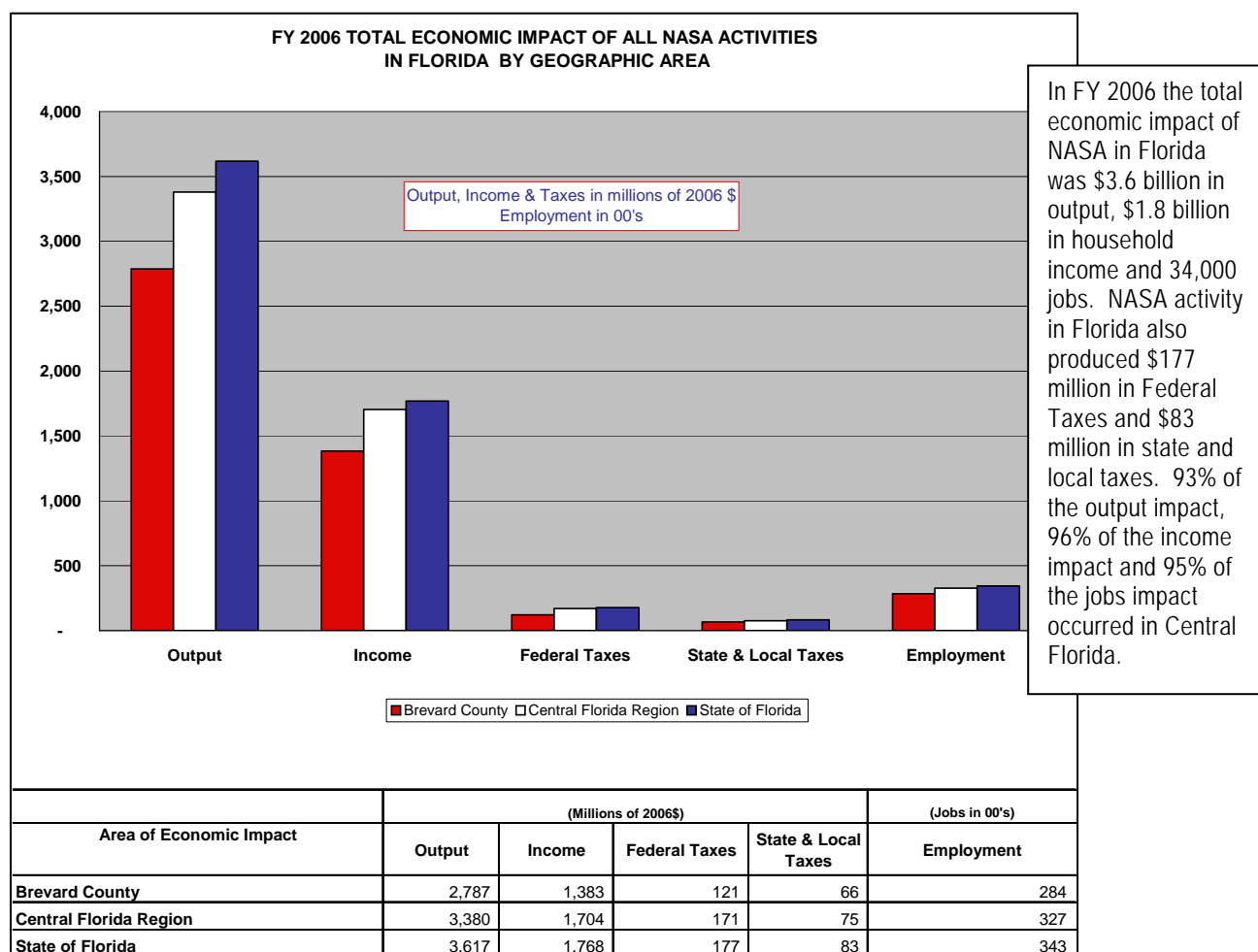


Exhibit 8

6.3. Impact Multipliers

Impact multipliers provide a summary measure of the economic potency of a particular economic activity. Multipliers were calculated in this study for Output, Income and Employment. The Output Multiplier is the total output impact as shown in Exhibit 8 above divided by the total direct spending for commodity purchases and wage payments to workers. The Income Multiplier is the total income impact shown in Exhibit 8 divided by the wage payments to all KSC based employees. Finally, the employment multiplier is the total employment impact shown in Exhibit 8 divided by the number of on-site employees at KSC.

The multipliers that were calculated for each of the geographic study areas in this analysis are shown in Exhibit 9. The jobs multiplier for the State as a whole indicates that each direct on-site job (i.e. Civil

Service and contractor employees) at KSC was multiplied into 2.45 total jobs throughout the Florida economy. It should be noted that this represents the direct job itself plus 1.45 jobs that were generated through the indirect economic process. The Florida income multiplier indicates that each dollar of direct wages that was paid at the KSC complex resulted in \$1.78 of total income in the State. The output multiplier shows that each dollar of direct total spending for commodity purchases and wage payments generated \$2.14 in total statewide output. Similar interpretations apply to the Central Florida and Brevard County multipliers.

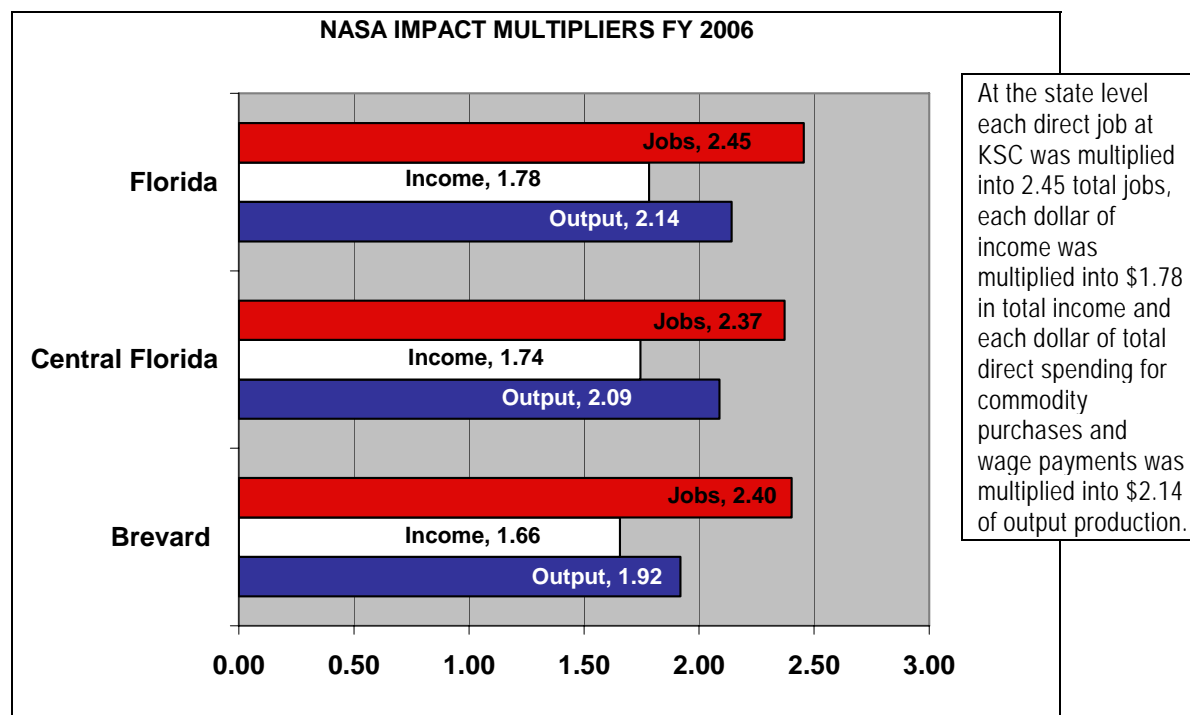


Exhibit 9

7. Summary

The monetary injections by KSC and other NASA Centers into the overall Florida economy in FY 2006 were up slightly (1%) from the previous year's level in current dollar terms. The higher level of injections reflected small but positive growth in on-site/near-site direct employment and wages and in commodity purchases. The large number of highly paid employees and the high dollar contracts that are awarded within the State created both a direct effect for state businesses and residents and a strong indirect impact on businesses and households that were not directly associated with the "space industry." In FY 2006 KSC and other NASA space operations and other on-base activities created a total economic impact for the State of \$3.6 billion in output, \$1.8 billion in income and 34,000 jobs. The total economic impact was highly concentrated in Central Florida with an output impact of \$3.4 billion, an income impact of \$1.7 billion and an employment impact of 33,000 workers.

8. Notes

The following are some notes about the study and this report.

Impact Models: The economic impact analysis presented in this report is generated by a set of regional input-output models constructed by the *Transportation Economics Research Institute* using the Minnesota IMPLAN Groups (MIG) software package. Structural data for the models, which is updated on an annual basis, was also provided by MIG.

Study Areas: Input-output models were constructed for three geographic areas—Brevard County, Central Florida (which includes Brevard, Flagler, Lake, Orange, Osceola, Seminole and Volusia Counties) and the State of Florida.

Data Sources: All data and numbers reported and used in this study are based on reports and data files provided through the Office of KSC's Chief Financial Officer or found on the KSC internet site. Numbers reported in the impact section of the report were generated by the economic impact models constructed for this study.

Methodology and Study Details: The methods of analysis, report assumptions and detailed tables of results are available upon request.

National Aeronautics and Space Administration
John F. Kennedy Space Center
Kennedy Space Center, FL 32899
www.nasa.gov

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